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(54) **Trampolines.**

(57) The disclosure relates to a trampoline comprising a hollow inflatable support (30) defining a space therewithin and a rigid frame (34) supported by said support and defining a space therewithin. Straps (64) pass over and engage said frame and pass around and engage said support to connect said frame to said support. Buckle (66) hold said straps in operative positions. A resilient trampoline mat (70) has an outer periphery connected by springs (76) to said frame to suspend the mat in the space within the frame and above the space within the support. A protective cover (80) formed of soft resilient material is supported above said frame and at least the portions of said spring means adjacent said frame to protect a user from injury due to contact with said frame or said spring means.

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The invention relates to a trampoline which is adapted to be used on all types of surfaces, including both land and water surfaces. In the past, trampolines have been designed for use either on land or on water, thereby limiting their use. It is therefore desirable to provide a trampoline which can be used on many different surfaces to thereby increase its versatility.

A pneumatic trampoline designed specifically for use on land or a hard surface is shown in U. S. Patent No. 3,130,816. In this arrangement, the pneumatic tube is deformed upon impact of a person jumping on the upper wall of the device, and the tube subsequently rebounds to provide lift to the jumper.

U. S. Patent No. 4,576,375 discloses a trampoline specifically designed for use on water. A pneumatic tube is used to support the trampoline on water, and a base cover is attached to the lower interior of the tube to seal off rapid air flow through the tube opening to the base of the tube and to create a substantially closed volume between the base cover and the water surface.

The above prior art devices cannot be successfully employed on surfaces other than that for which they are specifically designed, and accordingly, the use thereof is limited.

A problem existing with each of the foregoing discussed patented trampolines is that there is no provision for release of air pressure existing on the underside of the trampoline mat which is generated by jumpers using the trampoline. This air pressure will tend to distort the devices and tend to cause them to move laterally. This of course will cause undesirable wear and tear on the bottom of a trampoline supported on land or another hard surface. In the case of a trampoline supported on water, water turbulence and waves will be generated thereby making the trampoline unstable.

The present invention can be used on various surfaces such as snow, ice, mud, grass, soft ground, hard ground, water and ocean waves. Furthermore, the trampoline can be used in widely varying temperature environments ranging from freezing temperatures to more than 100 degrees Fahrenheit. The invention trampoline may be used by a skier to warm up before skiing where the trampoline is placed directly on the freezing snow. The trampoline can then be transported to a body of water such as a lake and used thereon the same day. At the ocean, the trampoline can be used either on the sand of the beach or on the incoming waves. It can also be set up on the back yard of a family's home on grass, dirt or gravel and the like.

The invention trampoline is designed to be of relatively large dimension, and in a typical example may have a diameter of between twelve and twenty feet with a height of between three and four feet. An inflatable support means in the form of a hollow torus provides a very stable construction which is adapted to

support several different people at one time while a jumper is bouncing on the mat of the device. The trampoline is constructed so that it can be easily assembled and disassembled, and when the support means is deflated, the trampoline may be readily transported from one location to another.

A rigid frame is supported at the upper portion of the support means, and the mat is resiliently suspended from the frame by metallic coil springs. A protective cover is supported around the periphery of the support means in overlying relation to the coil springs so that jumpers will not be injured by contact with the springs.

A significant feature of the invention is the provision of air release means which ensures that air pressure on the underside of the trampoline mat which is generated by jumpers using the trampoline will be evenly distributed from the space within the support means to ambient air. A large volume of air flow passes through the air release means when a jumper impacts on the trampoline and deforms it in a downward direction. This ensures that there is not a concentration of air pressure under the mat, thereby reducing wear and tear on the bottom of the support means when supported on land or other hard surface and reducing water turbulence when the trampoline is supported on water.

The air release means in a first form of the invention comprises a plurality of passages providing communication between the space within the support means and ambient air outside of the trampoline. These passage means extend through the support means and are substantially equally spaced along the support means. In another form of the invention, the passage means extends around the undersurface of the support means.

In a further modification of the invention, a plurality of resilient spaced bumpers are mounted on the upper portion of the support means, and the rigid frame is supported on the upper surfaces of these bumpers. This construction defines an air release means in the form of a plurality of open spaces between the support means and the frame which enables air pressure to escape from under the mat to ambient air.

In still another modification, a plurality of spaced frame supports support the rigid frame. These frame supports are rigid and are disposed in surrounding relation to the inflatable support means. The frame and mat are supported above the upper portion of the support means to define an air release means in the form of open spaces providing communication between the space within the support means and ambient air.

This latter form of the invention is especially designed to provide high performance conditions, or in other words to provide a greater amount of bounce to a jumper of superior skills. With this arrangement,

when a jumper lands on the mat, the load is distributed to the ring-shaped frame supports which are secured tightly about the support means. The rigid frame and mat therefore react substantially independently of the support means whether the trampoline is supported on land or on water. This is in contrast to an arrangement wherein the rigid frame rests directly on the upper portion of the support means so that the frame moves with the support means.

The various forms of the invention may also employ auxiliary air release means to release the air pressure beneath the trampoline mat. This auxiliary air release means preferably comprises a plurality of spaced holes formed through the protective cover.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an exploded vertical section showing three components of a trampoline according to a first form of the invention;

Fig. 2 is a similar section showing the three components in assembled position;

Fig. 3 is a top plan view of the upper one of the three components shown in Figs. 1 and 2;

Fig. 4 is a top plan view of the middle one of the three components shown in Figs. 1 and 2;

Fig. 5 is a top plan view of the lowermost one of the three components shown in Figs. 1 and 2;

Fig. 6 illustrates a modified construction;

Fig. 1a is a top plan view, partly broken away, showing another form of the invention;

Fig. 2a is a side elevation of the device shown in Fig. 1a;

Fig. 3a is a sectional view on an enlarged scale taken along line 3a-3a of Fig. 1a;

Fig. 4a is a sectional view on an enlarged scale taken along line 4a-4a of Fig. 1a and showing the protective cover in exploded position;

Fig. 5a is a top view of the protective cover;

Fig. 6a is a sectional view through opposite connected ends of the rigid frame;

Fig. 7a is a view similar to Fig. 6a showing the opposite ends of the rigid frame separated from one another;

Fig. 8a is a sectional view showing another modified form of the invention;

Fig. 9 is a top view of a further modification of the invention with certain components removed for the sake of clarity;

Fig. 10 is a sectional view on an enlarged scale taken along line 10-10 of Fig. 9;

Fig. 11 is a sectional view on an enlarged scale taken along line 11-11 of Fig. 9;

Fig. 12 is a top view partly broken away of the assembled modification shown in Fig. 9;

Fig. 13 is a sectional view showing the manner in which adjacent sections of the rigid frame are connected to one another;

Fig. 14 is a top perspective view showing the manner in which the rigid frame is connected to the support means;

Fig. 15 is a top view of still another modification of the invention with certain components removed for the sake of clarity; and

Fig. 16 is a sectional view on an enlarged scale taken along line 16-16 of Fig. 15.

Referring now to the drawings wherein like reference characters designate corresponding parts throughout the several views, as shown in Figs. 1 and 2, the three components illustrated are designated 10, 12 and 14. Component 10 (see also Fig. 3) comprises a circular frame 16 of corrosion resistant metal such as aluminum. This can be constructed using tubing bent to a circular form and then welded into a closed ring. It is preferred, however, that the frame 16 comprises a number of arcuate pieces of tubing the ends of which telescope into one another to form the circular frame. Spring loaded elements, such as U-shaped springs with heads on the outer faces of the ends of the arms thereof, can be used. The U-shaped springs are inside the inner pieces. The heads protrude outwardly through holes in the inner piece and enter holes in the outer piece.

Attached to the inner face of the frame 16 are radially extending coil springs 18 which are also of corrosion resistant metal. The inner ends of the springs are attached to loops (not shown) which are themselves secured around the periphery of a circular sheet 20 of a suitable fabric. A cross-woven NYLON fabric is preferred, but any flexible sheet material which is strong enough to withstand a fully grown person bouncing on it and which does not deteriorate in water can be used.

Component 12 is resilient and comprises a protective cover formed as a ring of foamed synthetic plastic material such as polystyrene or polyurethane. The undersurface of the component 12 is part-circular in radial cross-section and is of the same configuration as the outer face of component 14. On the radially inner face of component 12, there is a circumferentially extending slot 22 which receives the circular frame 16. An upper portion of component 12 overhangs the frame and covers not only the frame 16 but the radially outer parts of the springs 18.

Component 14 is in the form of an inflatable toroid and is fabricated using air and water tight synthetic plastic material sheeting such as neoprene sheeting. Component 14, which may be compartmented, has one or more air inlet valves (not shown) by means of which it can be inflated with air. The valve or valves are on the inner face of component 14 and below component 12.

Frame 16 is held in place on inflatable toroid 14 by a plurality of spaced straps 24 which pass over the frame 16 and around component 14 and which are tightened in position. Suitable buckles (not shown)

are provided for retaining the straps in operative position.

Referring to Fig. 6, a modified construction is disclosed wherein similar parts have been given the same reference numerals as corresponding parts shown in Figs. 1-5. In this modification, protective cover 12.1 is of generally rectangular cross-section and extends inwardly of the springs 18 so that a person using the device will not come into contact with the springs. It will be noted that straps 24 pass over the frame 16 and around component 14. The ends of each strap are connected with a conventional quick disconnect type of buckle 26 for holding the strap in tightened condition. Any number of circumferentially spaced straps 24 can be used. Eight equally spaced NYLON straps have been found to hold the components 10 and 14 together adequately. Buckles 26 are under the component 10 and are disposed against the inner face of component 14.

Referring now to Figs. 1a-8a inclusive, an inflatable support means 30 comprises a torus formed of a suitable material which is water-proof and substantially impermeable to air, and further which is resistant to wear and is heat insensitive. This material may be formed of neoprene or any suitable plastic such as vinyl plastic which can be readily welded. Conventional air valves 32 are provided at opposite sides of the support means for inflating the torus with air.

A tubular rigid frame 34 is formed of a corrosion resistant metal such as aluminum and bent into a circular configuration. As seen in Figs. 6a and 7a, the frame includes opposite ends 36 and 38 which are adapted to telescope together. End 36 is open to receive end 38, end 36 having a pair of diametrically opposite holes 40 formed therethrough. End 38 includes an insert 42 rigidly affixed within frame 34 and having a pair of radially opposite slots 44 therein. A locking spring has a bight portion 46 extending through a passage formed in insert 42 and includes a pair of opposite legs 48 normally biased outwardly into the position shown in Fig. 7a. The outer ends of legs 48 have locking lugs 50 formed thereon.

When end 38 of the frame is inserted into end 36 of the frame, the legs 48 must first be biased inwardly by hand so that the legs 48 are pushed downwardly into grooves 44. The end 38 is then pushed inwardly until lugs 50 move outwardly into holes 40, thereby locking the ends of the frame in position. When it is desired to release the ends of the frame from one another, the lugs are pushed inwardly and end 38 is withdrawn.

The frame is attached to the upper portion of the inflatable support means by a plurality of similar substantially equally spaced attaching means 58. As seen in Figs. 1a and 3a, each attaching means includes a sheet of vinyl plastic 60 which is welded around the outer periphery thereof to the upper surface of support means 30. Each of sheets 60 is pro-

vided with a pair of spaced slits 62 formed therethrough. Each strap 64 passes through one of these slits, under the portion of the sheet between the slits and thence through the other of the two slits. Each strap passes around the frame, and the opposite ends of the strap are secured to one another by a conventional quick release type buckle 66. These attaching means enable the frame to be quickly attached to and released from the support means.

A trampoline mat 70 formed of cross-woven NYLON or the like has a reinforced outer periphery 72 having a plurality of spaced grommets 74 mounted therein. The frame has a corresponding plurality of holes formed therein, and conventional coil springs 76 have the opposite curved ends thereof disposed in a grommet in the mat and a hole in the frame as seen in Figs. 3a and 4a. In this manner, the mat is resiliently supported by the frame.

A protective cover 80 is of elongated rectangular construction as seen from the top in Fig. 5a and has a rectangular cross-sectional configuration as shown in Figs. 3a and 4a. A thin cover 82 of vinyl plastic or canvas surrounds a body 84 formed of resilient cushioning material such as foamed polyurethane. A drawstring 86 is provided within a tubular portion 88 provided on one edge of the cover. The cover is bent from the linear configuration shown in Fig. 5a into a substantially circular configuration as shown in Fig. 1a with the opposite ends of the cover meeting along a line 90. The opposite ends of the drawstring are knotted at 92 to retain the cover in its circular configuration.

Connecting means is provided for connecting the cover to the frame means in the form of a plurality of spaced straps 94 which may be formed of NYLON. As seen in Fig. 4a, these straps each have an portion thereof secured to the cover by stitching at 96. The free ends 98 and 100 of each of the straps extend around the frame and are connected to one another as by tying them together, for example. This connecting means enables the cover to be readily connected and disconnected from the frame.

When the cover is in the operative position shown in Figs. 1a and 3a, it is disposed in overlying relationship to the coil springs and prevents jumpers from being hurt by contact with the springs. The cover also serves as an area upon which persons may sit on the trampoline.

As seen in Fig. 1a, air release means is provided in the form of a plurality of substantially equally spaced passages 110 shown as being four in number. The number and size of the passages may be varied as long as they are substantially equally spaced to as to ensure that the air pressure on the underside of the trampoline mat is evenly distributed from the space within the support means. As seen in Fig. 3a, each of the passages is defined by a substantially radially extending tubular portion 114 formed of the same ma-

terial as support means 30. The opposite ends 116 and 118 of each tubular portion is welded to the support means in watertight and airtight relationship.

In addition to the passages 110, auxiliary air release means may be incorporated into the cover. As seen in Fig. 1a, the cover may be provided with a plurality of holes 120 formed vertically therethrough. Any suitable number and size of holes may be used, and they should be substantially equally spaced from one another. In a typical example, the holes may be twelve in number and have a diameter of about two inches. These holes will allow air pressure to escape from underneath the mat, through the space between the springs and thence upwardly through the holes to ambient air. It should be understood that only a minor portion of the air pressure will escape through holes 120.

Referring to Fig. 8a, an inflatable support means 30' is similar to support means 30 previously described except that the passages 110 are eliminated in the construction shown in Fig. 8a. In this latter modification, the passages are replaced by air release means which is external of the support means and extends around the undersurface of the support means.

Each air release means includes a tubular sleeve 130 formed of vinyl plastic or the like which is welded to the outer surface of the support means and which has opposite open ends 132 and 134. An elongated flexible pipe 136 which may also be formed of vinyl plastic is of more rigid construction than sleeve 130. This pipe is slid into the operative position shown with the opposite open ends thereof 138 and 140 extending beyond the ends 132 and 134 of the sleeve. It is apparent that pipe 136 serves the same purpose as the passages 110 previously described to allow air pressure on the underside of the mat to be distributed from the space within the support means to ambient air. Pipes 136 may be spaced about the support means in the same manner as passages 110. It is apparent that the inner diameter of the pipes 136 is selected so as to enable the proper volume of air to pass therethrough.

As seen in Figs. 1a, 2a and 4a, a ladder is indicated generally by reference character 150. The ladder is formed of a suitable corrosion resistant material such as aluminum and includes a pair of parallel side members 152 having steps 154 connected therebetween. The side members are curved at the upper portions thereof as seen most clearly in Fig. 4a to as to conform to the outer configuration of support means 30.

The upper ends of the side members 152 have holes formed therethrough which receive straps 156 formed of NYLON or the like. The outer end of each strap is threaded through the hole in one of the side members and is secured in position by a conventional quick disconnect buckle 158. The inner end of each

strap is wrapped around rigid frame 34 and is secured in position by a similar buckle 160. With this arrangement, the ladder may be quickly and easily connected to or disconnected from the trampoline. In order to protect the outer surface of the support means from damage due to rubbing of the ladder thereon, a sheet of antiabrasive protective material 162 is welded on the outer surface of the support means. This sheet may be formed of vinyl plastic.

As seen in Fig. 2a, anchor means is provided for anchoring the trampoline in position on a body of water. The anchor means includes a plurality of straps 170 formed of suitable material such as NYLON, the straps preferably being four in number. The upper ends of the straps pass around the rigid frame and are secured in position by conventional quick disconnect buckles 171, one of which is seen in Fig. 1a. The lower ends of the straps are connected to a common ring fitting 172. An anchor line 174 which may also be formed of Nylon connects fitting 172 to an eye 176 formed at the upper end of a pin type anchor 178 sunk into the bottom 180 of the body of water. The upper surface of the water is indicated at 182.

It should be understood that in all forms of the invention the inflatable support means serves to enhance the bounce performance of the trampoline as well as providing flotation on a body of water. The air pressure within the support means may be varied as desired to regulate the height of the bounce.

Referring now to Figs. 9-14, another form of the invention is shown. The inflatable support means 30" is formed in fourteen sections which are welded together, the material being similar to that of the support means previously described. Conventional air valves 190 are mounted on diametrically opposite portions of the inner surface of the support means for inflation thereof. Protective strips 192 are secured to the upper surface of each of the sections of the support means as by welding. Each of these strips is welded to the support means and includes a plurality of superimposed layers of abrasive resistant material such as vinyl plastic. These layers are shown as being three in number in Figs. 10 and 11. The strips prevent undue wear on the support means in the event that the frame contacts the support means during use.

Resilient bumpers 200 are mounted as by welding on the upper surface of alternate strips 192. These bumpers are formed of ultra high molecular weight plastic such as polyethylene. The bumpers support a rigid frame 34' on the upper surfaces of the bumpers. The bumpers serve a dual purpose in that they serve to increase the bounce of the trampoline and also space the frame and mat supported thereby above the upper surface of the support means to provide an air pressure release means. It is noted that a plurality of open spaces are defined between the support means and the frame as well as between adjacent bumpers to provide communication between the space within

the support means and ambient air outside of the trampoline so that air pressure on the underside of the mat is evenly distributed from the space within the support means to ambient air.

In this form of the invention, the rigid frame is preferably formed in four sections which are rigidly connected to one another. As seen in Fig. 13, the end 210 of one section of the frame receives the reduced size end 212 of an adjacent section so that these ends telescope together. Aligned openings are formed in diametrically opposite portions of the two ends, and a bolt 214 extends through these aligned openings. A wing nut 216 is threaded on the outer threaded end of the bolt to rigidly secure the two ends to one another. Each pair of adjacent sections are secured to one another in the manner shown in Fig. 13.

As seen in in Figs. 9 and 14, connecting means is provided adjacent each of the bumpers for connecting the frame to the support means. Each connecting means includes a pair of similar spaced flaps 220. Each flap has a bottom portion 222 which is welded to the upper surface of the support means and an upwardly extending portion 224 which is disposed at substantially right angles to the portion 222. Portions 224 each have five eyelets formed in the upper edge thereof, and a strap 226 formed for example of NYLON is threaded through these eyelets with the opposite ends of each strap being secured in position by a conventional quick disconnect buckle 228. With this arrangement, the frame may be easily connected to and disconnected from the support means.

A plurality of coil springs 76' similar to springs 76 previously described are connected between frame means 34' having suitable holes formed therein and a mat 70' similar to mat 70 previously described to resiliently support the mat from the frame. A protective cover similar to cover 80 previously described is also disposed over the frame in the same manner as described previously, this cover being removed in Fig. 12 for the sake of clarity. A ladder and anchor means similar to those previously described may also be employed with this form of the invention.

Referring to Figs. 15 and 16, a further modification of the invention is illustrated. In this form of the invention, the inflatable support means 30" and the protective strips 192 thereon are identical to those shown in Fig. 9. A rigid frame 240 is provided and may be of the same construction as either of the two frames previously described. In this form of the invention, the frame is supported by a plurality of frame supports 242 shown as being three in number. These frame supports are preferably substantially equally spaced from one another and are of rigid construction. The frame supports are substantially annular in configuration and surround and snugly engage the outer periphery of support means 30".

As seen in Fig. 16, each frame support comprises a pair of similar semi-circular tubular portions 242 and

246 which are suitably connected to one another when in the assembled position. For example, the adjacent ends of the two portions may be connected together with connecting means as shown in Figs. 6a and 7a or any other suitable interconnecting means.

As seen in Fig. 16, each of frame supports 242 includes an integral upwardly and inwardly projecting stub portion 250 having a cylindrical outer surface thereon. Frame 240 includes three spaced downwardly and outwardly extending projections 252 each of which has an open ended cylindrical cavity therein such that each stub portion 250 is telescoped into and snugly received within the cavity defined in the associated projection 252. In this manner the frame is supported on the support means by the spaced frame supports in an effective manner. It is apparent that the frame can be readily placed into and removed from the operative position shown. While three frame supports have been shown, the number may be varied as long as they are substantially equally spaced about the support means.

A mat (not shown) is supported from frame 240 in the same manner as previously described, the frame being provided with suitable holes for this purpose. A protective cover as previously described (not shown) is also associated with the trampoline in this form of the invention. A ladder and anchor means similar to those previously described may also be employed with this form of the invention.

It will also be noted that the frame is supported in spaced relationship to the support means to form open spaces between the support means and the frame which provide communication between the space within the support means and ambient air outside of the trampoline so that air pressure on the underside of the trampoline mat is evenly distributed from the space to ambient air.

The invention has been described with reference to certain embodiments. Obviously, modification, alterations and other embodiments will occur to others upon reading and understanding this specification. It is our intention to include all such modifications, alterations and alternate embodiments insofar as they come within the scope of the appended claims or the equivalent thereof.

Claims

1. A trampoline comprising a hollow inflatable support means defining a space therewithin, a rigid frame supported by said support means and defining a space therewithin, strap means passing over and engaging said frame and passing around and engaging said support means for connecting said frame to said support means, buckle means for holding said strap means in operative position, a resilient trampoline mat having an

- outer periphery, spring means connecting said frame to the outer periphery of said mat to suspend the mat in the space within the frame means and above the space within said support means, and a protective cover formed of soft resilient material supported above said frame and at least the portions of said spring means adjacent said frame to protect a user from injury due to contact with said frame or said spring means.
2. An all surface trampoline comprising an inflatable support means having upper and lower portions and defining a space therewithin, means for inflating said inflatable support means with air, a trampoline mat resiliently supported by an upper portion of said inflatable support means, and air release means including a plurality of passages providing communication between said space and ambient air outside of said trampoline, said passages being disposed at laterally spaced locations along said inflatable support means and being below and spaced from said trampoline mat so that air pressure on the underside of the trampoline mat which is generated by jumpers using the trampoline will be evenly distributed from said space to ambient air.
 3. A trampoline as defined in claim 2 wherein each of said passages passes completely through said inflatable support means and includes opposite ends, one end of each of said passages opening into said space and the opposite end of each of said passages opening to ambient air.
 4. A trampoline as defined in claim 2 wherein said inflatable support means is substantially annular in configuration and of substantially circular cross-section, each of said passages extending substantially radially of the inflatable support means.
 5. A trampoline as defined in claim 2 wherein said passages are substantially equally spaced along said inflatable support means.
 6. A trampoline as defined in claim 2 wherein each of said passages extends around the undersurface of said inflatable support means.
 7. A trampoline as defined in claim 6 wherein each of said passages includes tubular means supported by said inflatable support means, and pipe means supported within each of said tubular means.
 8. A trampoline as defined in claim 2 including a rigid frame supported by an upper portion of said inflatable support means, spring means connecting said frame means to said trampoline mat, and a protective cover formed of soft resilient material connected to said frame and overlying said spring means to protect jumpers from damage, said protective cover including auxiliary air release means for transmitting air from said space to ambient air.
 9. A trampoline as defined in claim 8 wherein said auxiliary air release means comprises a plurality of spaced holes formed through said protective cover.
 10. A trampoline as defined in claim 8 including ladder means supported by said frame and extending downwardly from said inflatable support means, and antiabrasive protective sheet means on said inflatable support means engageable with said ladder to prevent excessive wear on said support means.
 11. A trampoline as defined in claim 8 including a plurality of straps connected to said said frame means at spaced positions therealong, said straps being connected to a common fitting, said fitting being connected to an anchor means adapted to be anchored in the bottom of a body of water.
 12. An all surface trampoline comprising an inflatable support means including an inner periphery and an outer periphery, said inner periphery surrounding a space therewithin, means for inflating said inflatable support means with air, a trampoline mat resiliently supported by said inflatable support means, and air release means supported by said inflatable support means, said air release means providing communication between said inner periphery and said outer periphery for transmitting air between the space below said trampoline mat and a plurality of separate locations about said outer periphery so that air pressure on the underside of the trampoline mat which is generated by jumpers using the trampoline will be evenly distributed and not concentrated in a particular portion of the trampoline mat.
 13. A trampoline as defined in claim 12 wherein said air release means includes a first plurality of holes opening at said inner periphery and a second plurality of holes opening at said outer periphery and transfer means for transferring air between said first and second holes.
 14. A trampoline as defined in claim 13 wherein said transfer means is disposed within said inflatable support means.

15. A trampoline as defined in claim 13 wherein said transfer means is disposed externally of said inflatable support means.

16. A trampoline as defined in claim 13 wherein said first and second plurality of holes are disposed at substantially equally spaced locations along said inner and outer periphery respectively.

17. A trampoline as defined in claim 12 including a rigid frame supported by an upper portion of said inflatable support means, said frame including opposite end portions which are detachably connected to one another.

18. A trampoline as defined in claim 12 including a rigid frame supported by an upper portion of said inflatable support means, spaced attaching means for attaching said frame to said inflatable support means, each of said attaching means comprising a first piece of material secured to said inflatable support means and having a pair of spaced slits formed therethrough, a second piece of material threaded through said slits and including opposite free ends, said second piece of material extending around said frame, and buckle means securing the free ends of said second piece of material to one another.

19. A trampoline as defined in claim 12 including a rigid frame supported by an upper portion of said inflatable support means, spring means connecting said frame to said trampoline mat, and a protective cover formed of soft resilient material connected to said frame and overlying said spring means to protect jumpers from damage, said protective cover having opposite ends, and means for securing said opposite ends to one another.

20. A trampoline as defined in claim 19 including a plurality of spaced connecting means for connecting said cover to said frame, each of said connecting means comprising a strap having an intermediate portion secured to said cover and having opposite free ends extending around said frame and connected to one another.

21. A trampoline as defined in claim 19 wherein said protective cover has a plurality of spaced holes formed therethrough to provide an auxiliary air release means.

22. A trampoline comprising an inflatable support means having upper and lower portions and defining a space therewithin, means for inflating said inflatable support means with air, a rigid frame, a trampoline mat, resilient means connecting said frame to said mat, a plurality of spaced resilient

bumpers mounted on the upper portion of said support means, said frame being supported by said bumpers so that said frame and mat are supported above the upper portion of the support means to define open spaces between said support means and said frame providing communication between said space within said support means and ambient air outside of the trampoline so that air pressure on the underside of the trampoline mat which is generated by jumpers using the trampoline will be evenly distributed from said space within said support means to ambient air.

23. A trampoline as defined in claim 22 including connecting means disposed adjacent said bumpers for connecting the frame to the support means.

24. A trampoline mat as defined in claim 23. wherein said connecting means comprises a pair of spaced flaps having holes therein, strap means threaded through said holes and about said frame, and buckle means to secure said strap means in operative position.

25. A trampoline mat as defined in claim 22 wherein said frame includes a plurality of separate sections, and means for rigidly connecting the sections to one another.

26. A trampoline mat as defined in claim 22 including protective strip means mounted on said upper portion of the support means and underlying said frame to prevent damage to the support means.

27. A trampoline mat comprising, an inflatable support means having upper and lower portions and defining a space therewithin, means for inflating said inflatable support means with air, a rigid frame, a trampoline mat, resilient means connecting said frame to said mat, a plurality of spaced frame supports supporting said frame at spaced portions thereof, each of said frame supports being rigid and disposed in surrounding relation to said support means, said frame supports supporting said frame so that said frame and mat are supported above said upper portion of the support means to define open spaces between said support means and said frame providing communication between said space within the support means and ambient air outside of the trampoline so that air pressure on the underside of the trampoline mat which is generated by jumpers using the trampoline will be evenly distributed from said space within the support means to ambient air.

28. A trampoline as defined in claim 27 wherein each of said frame supports includes a plurality of por-

tions, and means connecting said frame support portions to one another.

29. A trampoline as defined in claim 27 including protective strip means mounted on said upper portion of the support means and underlying said frame to prevent damage to said support means. 5
30. A trampoline as defined in claim 27 wherein said frame is supported on said frame supports by telescoping members connected to said frame and frame supports respectively. 10

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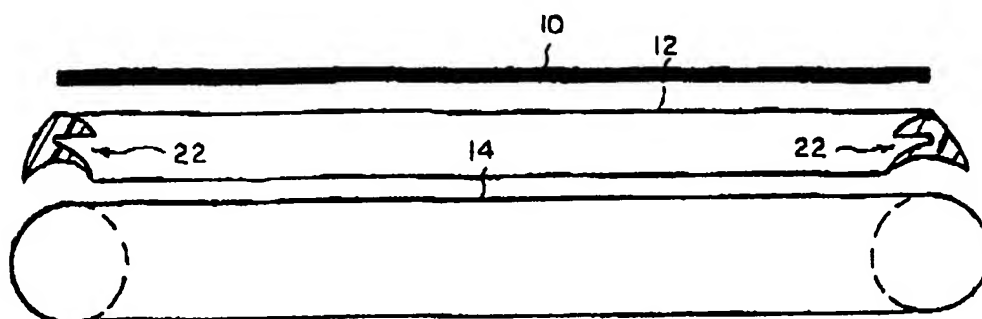


FIG. 1

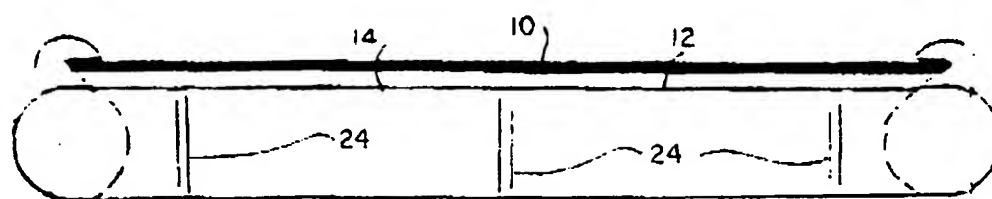


FIG. 2

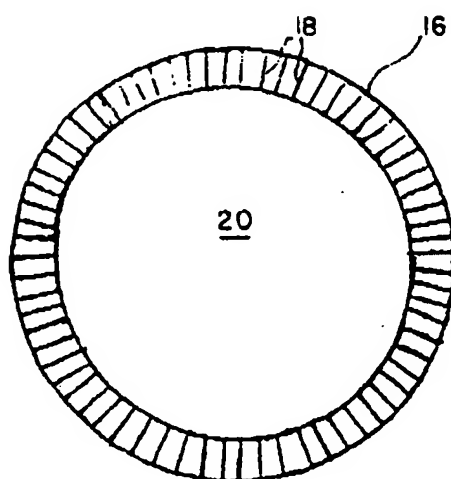


FIG. 3

FIG. 1a

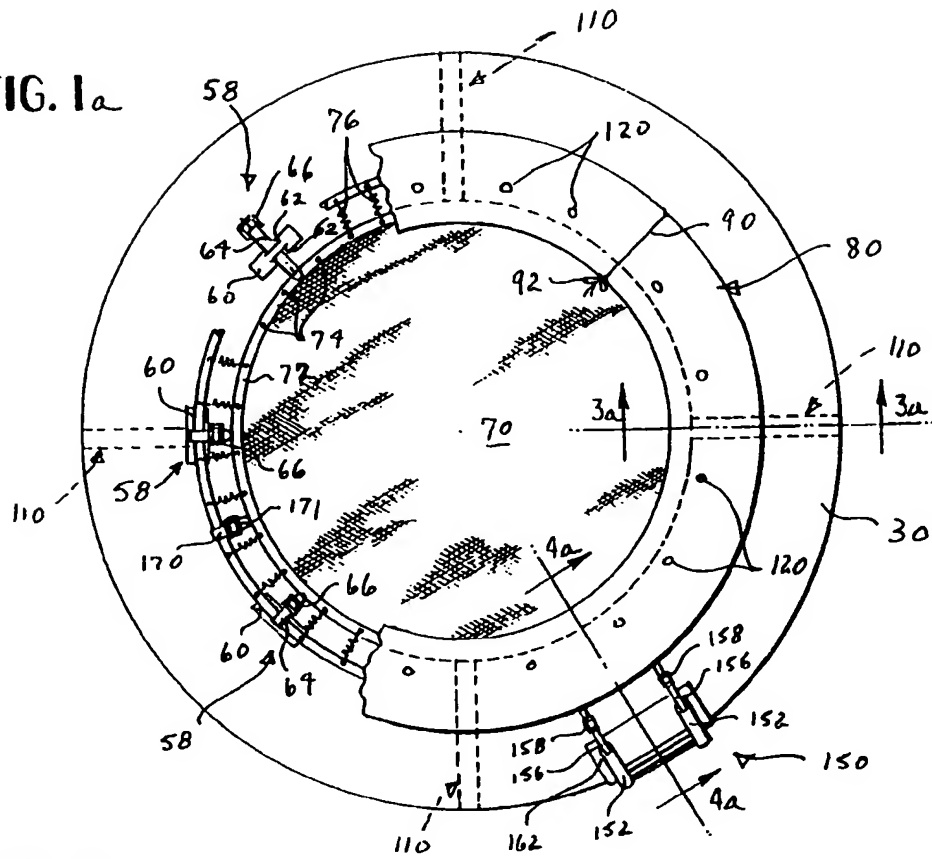
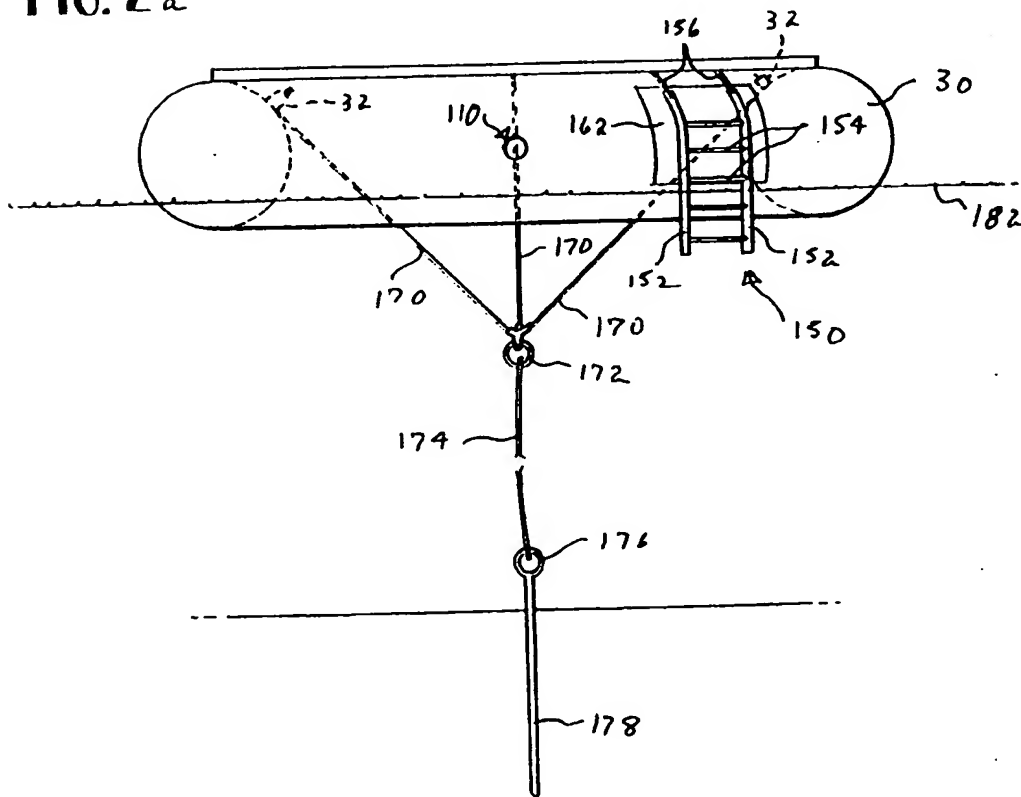
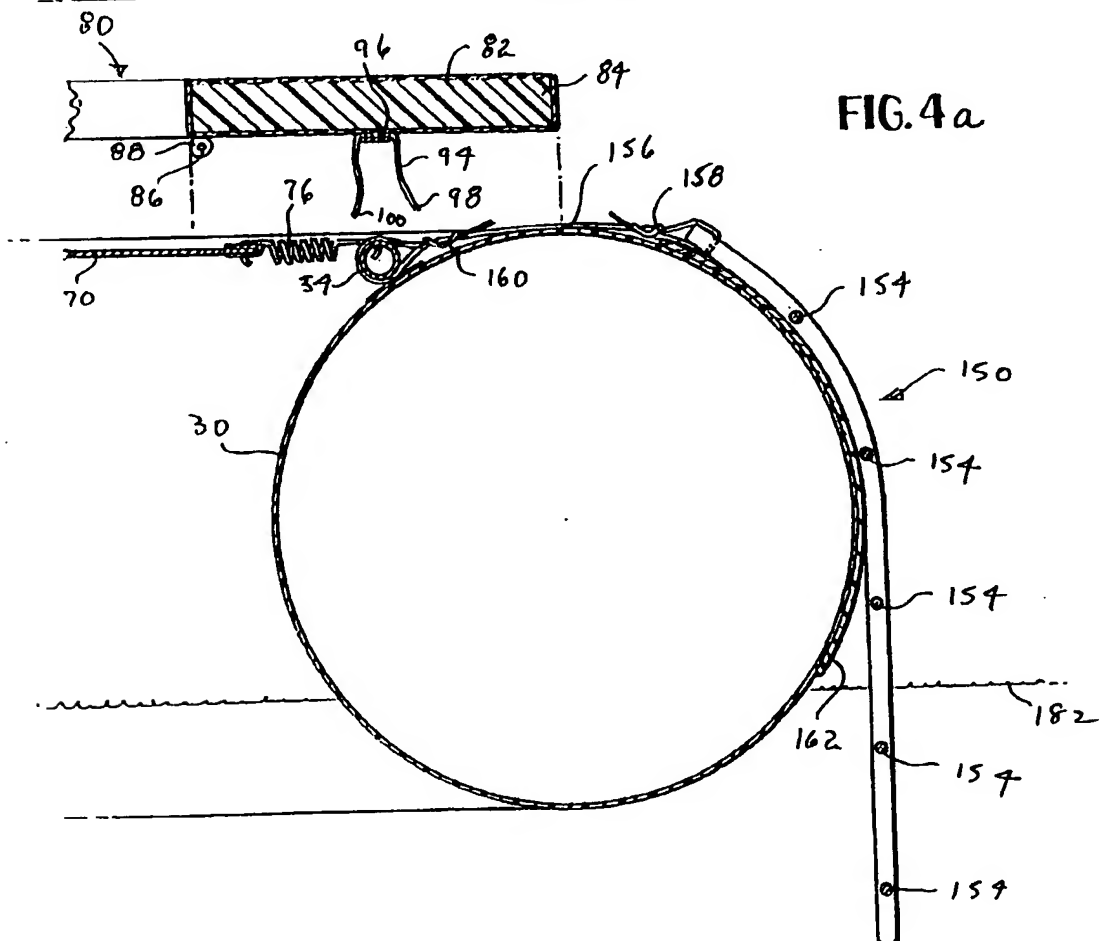
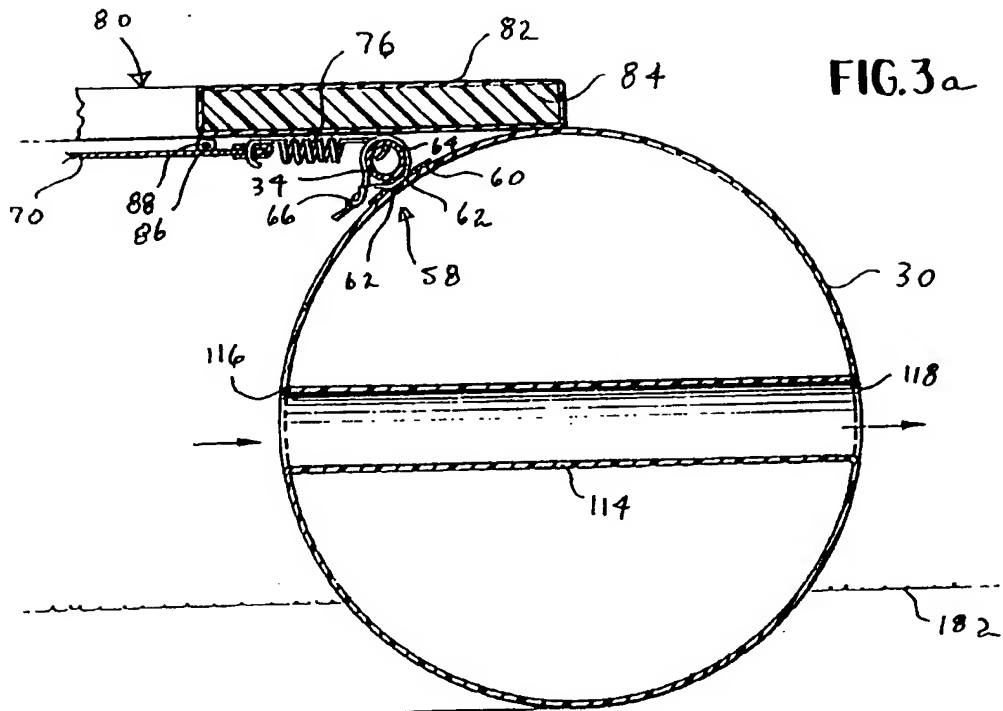


FIG. 2a





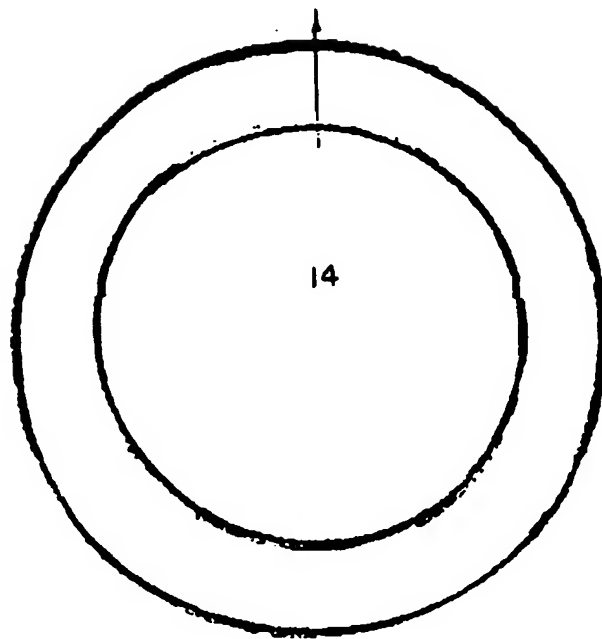
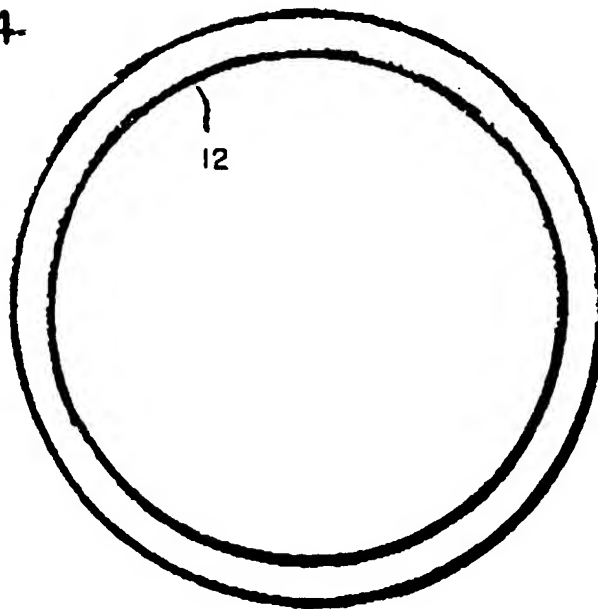
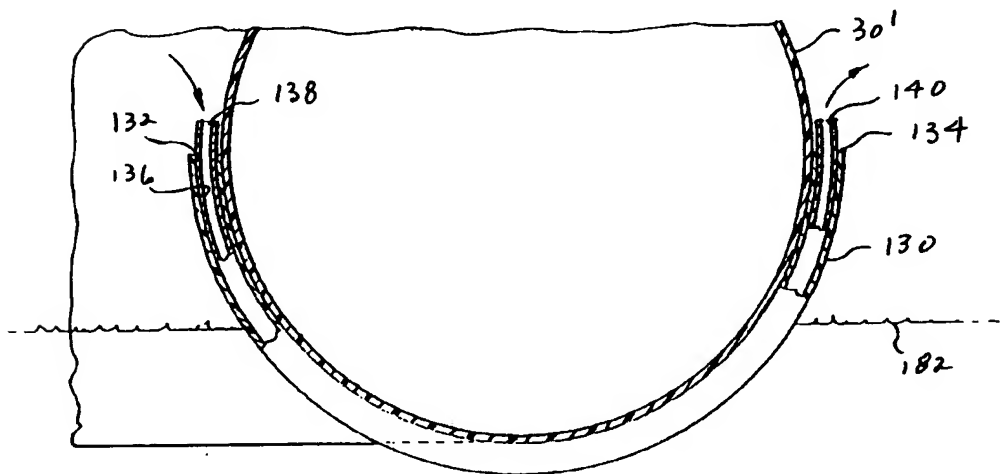
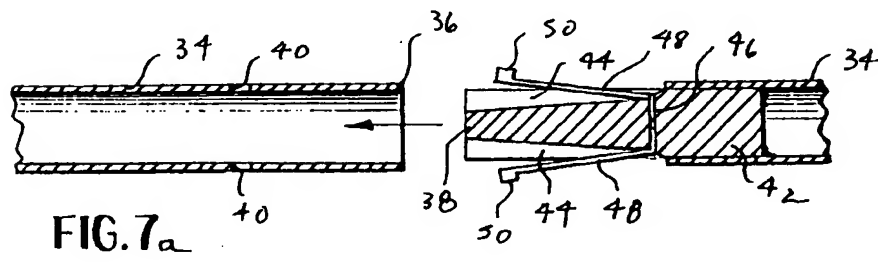
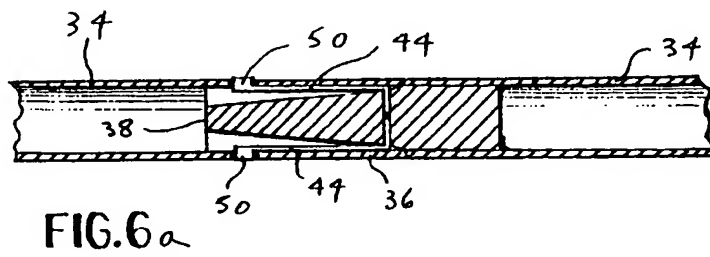
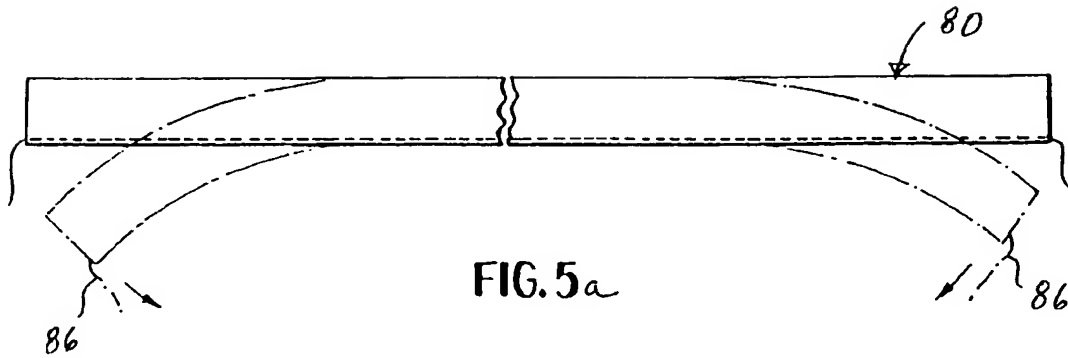


FIG. 5

FIG. 4





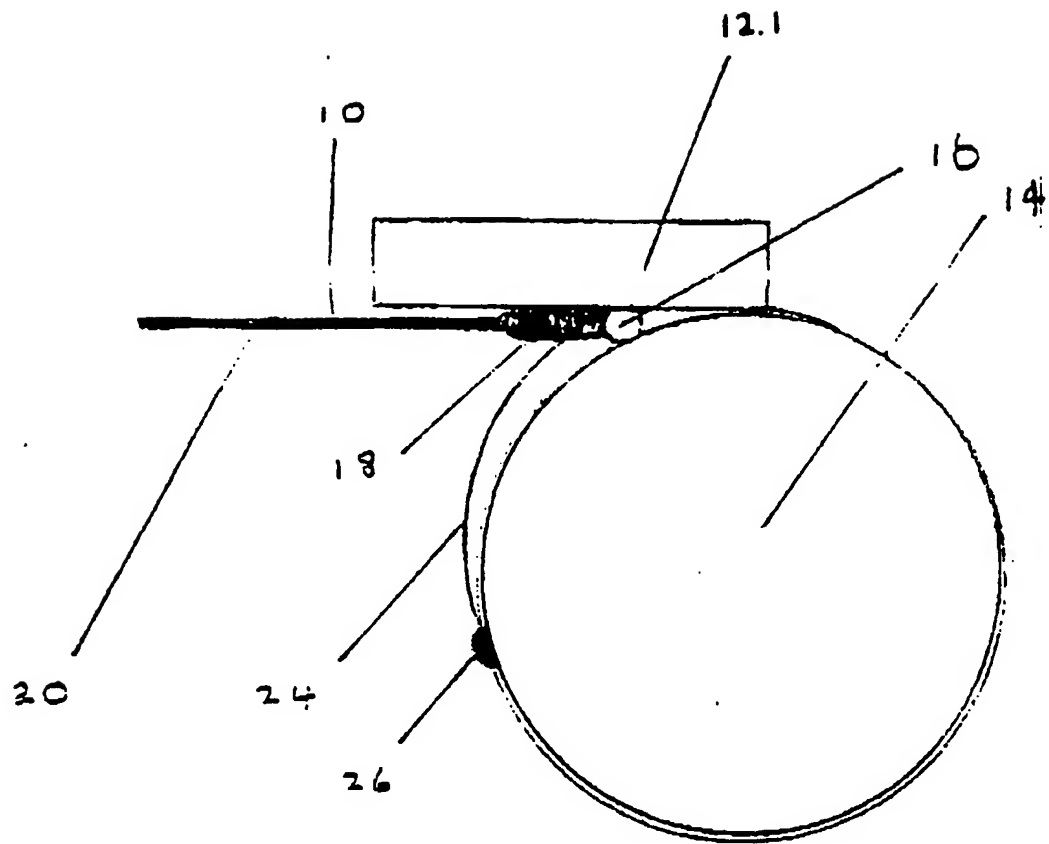


Fig. 6

FIG. 9

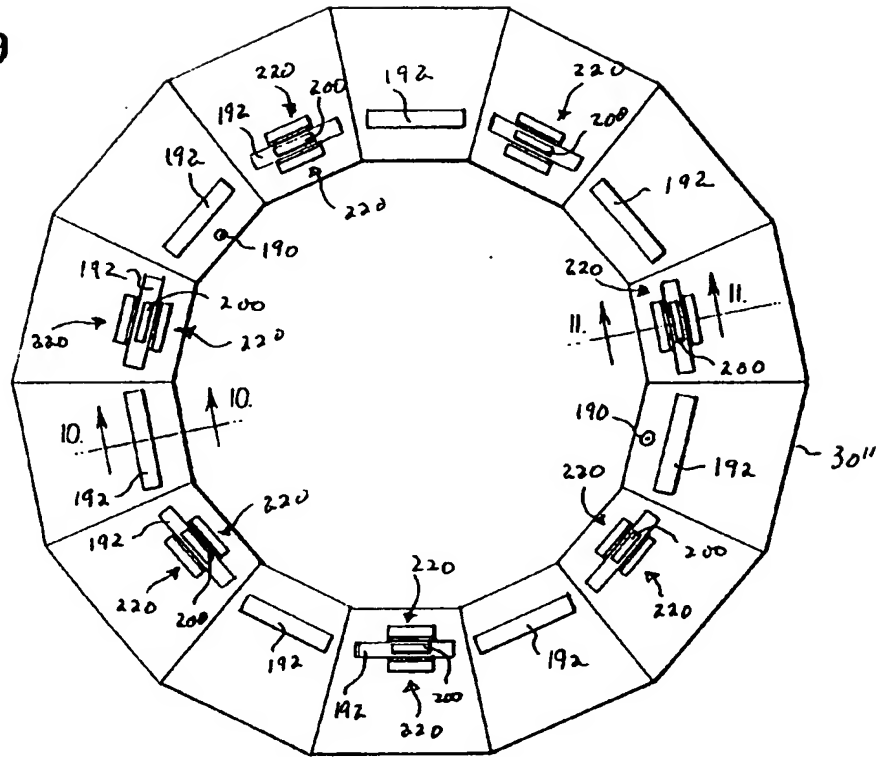


FIG. 10

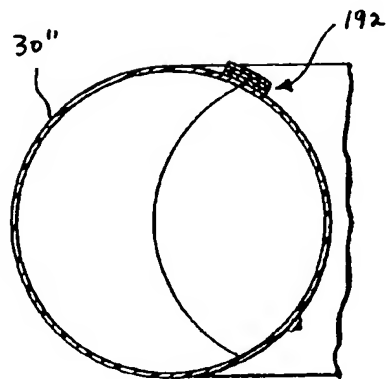
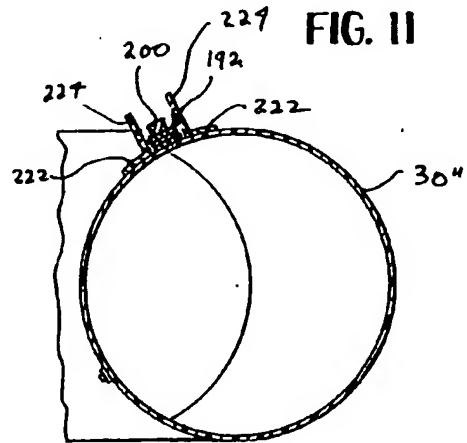


FIG. 11



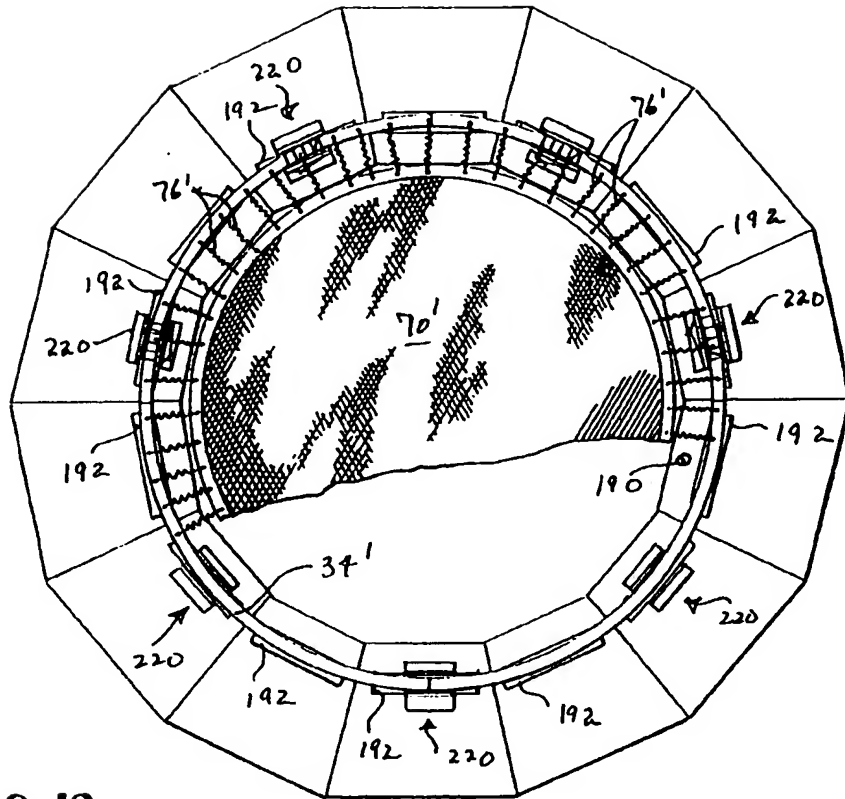


FIG. 12

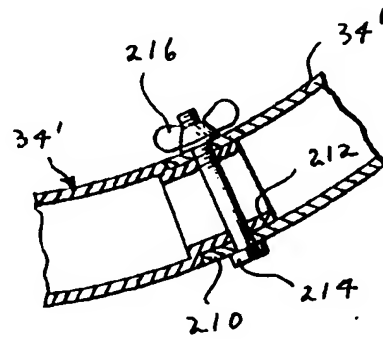


FIG. 13

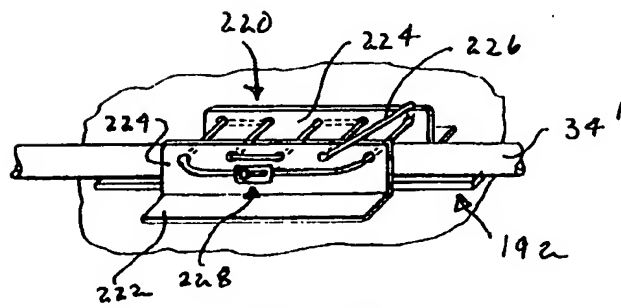


FIG. 14

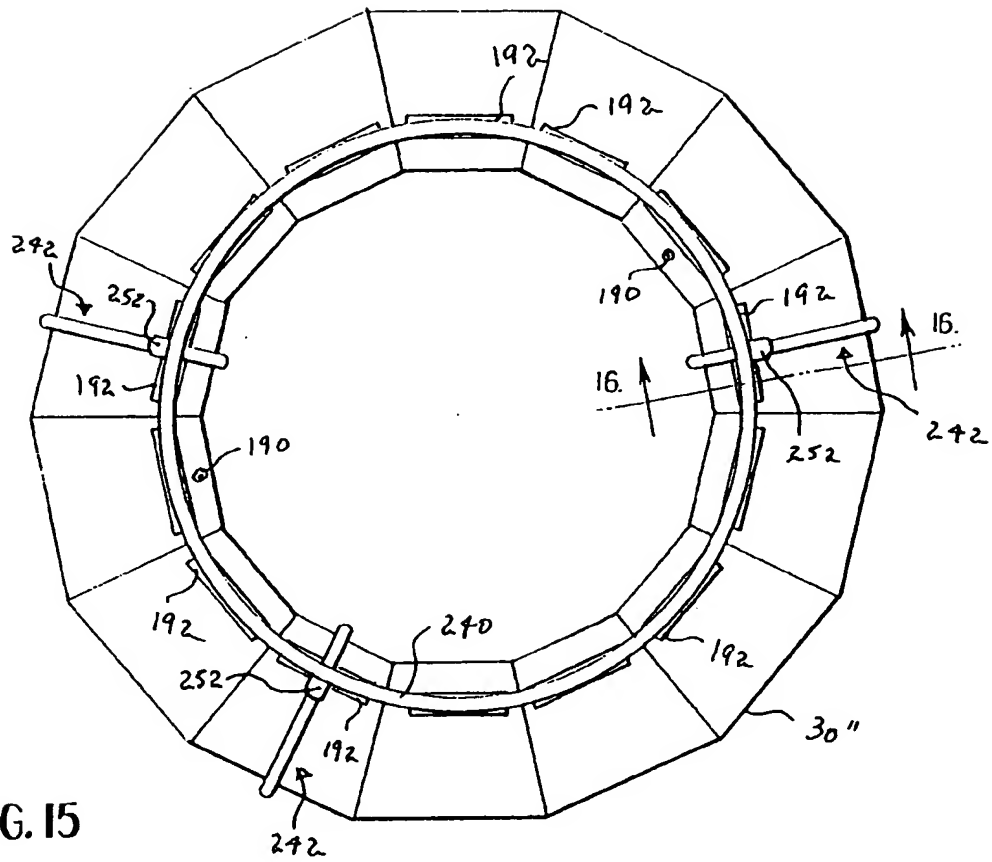


FIG. 15

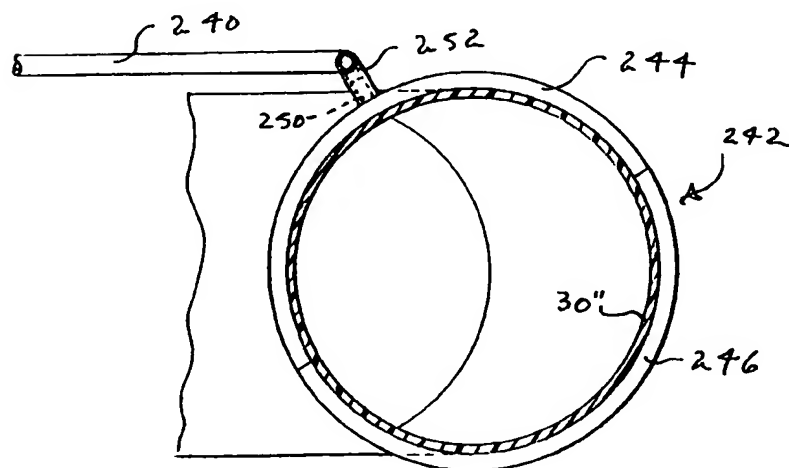


FIG. 16



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 91307945.5
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D, X	<u>US - A - 4 576 375</u> (ROBERTS) * Totality *	1	A 63 B 5/11 A 63 B 5/10
A	* Totality *	2, 4, 8, 11, 12, 17, 19, 20, 22, 27, 29	
A	<u>US - A - 4 644 892</u> (FISHER) * Fig. 5; fig. 1-3, 9; description *	1, 2, 8, 10-12, 19, 20, 22, 24, 27	
A	<u>GB - A - 2 107 201</u> (JOHNSON) * Description; fig. 1, 2 *	1, 4, 8, 11, 12, 18, 19, 27	
A	<u>EP - A1 - 0 177 662</u> (CORVINOS & ROTH) * Claims 1, 3, 4, 7, 8, 9, 12; fig. 1, 2, 4, 5 *	1, 2, 10, 22, 27, 28	TECHNICAL FIELDS SEARCHED (Int. Cl.5) A 63 B 5/00 A 63 G 31/00
A	<u>US - A - 4 037 834</u> (OAKS) * Abstract; claims 1, 6; fig. *	1, 2, 4, 12, 22, 27	
A	<u>AT - B - 265 935</u> (ZIERMANN) * Fig.; description *	1, 2, 12, 22	
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 12-10-1991	Examiner SCHÖNWÄLDER
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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